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ABSTRACT

Eight basic gaps in the college teaching and learning process are described, and teachers are encouraged to use classroom research as a "zipper" to help close them. The gaps include those between: (1) teaching and learning, to be remedied by clear definition of teaching goals and continuous feedback on learning outcomes; (2) teaching and testing, to be narrowed with a device that teaches and tests simultaneously; (3) the process of teaching and its content, which can be improved through better understanding of instructional methods appropriate to different subject matters; (4) curriculum and instruction, to be narrowed by classroom investigations, particularly collaborative, to assess whether aggregated teaching goals add up to a curriculum and how much of it students are gaining; (5) assessment and the improvement of learning, for which teachers can gather relevant information about what is happening in their own classrooms; (6) educational research and practice, which teachers can narrow by the credibility of their own research efforts; (7) research and teaching by the same individual, for which classroom research is a logical remedy; and (8) intrinsic and extrinsic rewards in the academic profession, which classroom research can change by giving visibility, and mobility, to those who show talent for teaching. (MSE)

IN SEARCH OF ZIPPERS

by K. Patricia Cross

While learning has many ends, teaching has only one: to enable or cause learning.

In the era before zippers, a malady known as "gaposis" plagued the land. It was illustrated in advertisements by an ill-fitting blouse or shirt with gaps between overworked buttons. The malady was rendered obsolete by the zipper, whose function it was to eliminate such gaps.

I hesitate to add to our burdens in education today by diagnosing problems so unseemly as to constitute "gaposis," but for several years now, I have been searching for zippers that will reduce a few quite noticeable gaps in our practice of education. (See *AAHE Bulletin*, September, 1985; September, 1986.)

My colleague Tom Angelo and I have been working on the invention of one type of zipper called "classroom research," which we define as the study by classroom teachers of the impact of their teaching on the students in their classrooms. The basic premise of classroom research is that teachers should use their classrooms as laboratories to study the learning process as it applies to their particular disciplines; teachers should become skillful, systematic observers of how the students in their classrooms learn. To help teachers do this, we are developing basic tools that teachers, across a wide variety of disciplines, can use in their own classrooms to assess students' learning, and to conduct modest experiments on the impacts of their teaching. It is our hope that this empowerment of teachers in the assessment movement will narrow a number of gaps.

1 The first gap is that between teaching and learning. Teaching and learning are not necessarily two complimentary aspects of the same phenomenon. Learning can and does go on without teaching. Unfortunately, too, teaching can and does go on without learning. But while learning has many ends, teaching has only one: to enable or cause learning.

I am not suggesting that teachers can close the teaching/learning gap without the cooperation of students. Learners share in the responsibility for the effectiveness of education. Much as a zipper

involves both sides equally in moving toward closure, so classroom research seeks to make teachers and learners equal partners in narrowing the gap between teaching and learning.

By the same imagery, however, the zipper becomes stuck when teachers believe that their sole obligation is to present material in a clear and logical manner. Unless teachers can make connections between their teaching and what students already know, learning is not likely to follow. The purpose of classroom research is to provide continuous feedback on what students know and learn, so that teachers and students can relate to one another by making all those little connections that move teaching and learning closer together.

Making those connections is a labor-intensive enterprise that has powerful implications for increasing the productivity of education. Depending on the goals of the teacher, the gap between what is taught and what is learned can be perceived in rather straightforward terms that might be expressed numerically, as in "students answered correctly 60% of the questions about the lecture." Or it might be perceived in a far more complex manner. If the goal of the teacher, for example, is to teach critical thinking, then the teacher needs to be clear about what he or she is doing to teach critical thinking, how that connects with what students already know and are capable of doing,

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and what criteria will be used to determine whether students are indeed learning to think critically.

All of us would like to find a zipper that could reduce the gap between teaching and learning. That zipper, we suggest, lies in a clear definition of teaching goals, coupled with continuous feedback on learning outcomes. Our early efforts at Harvard have gone into the design of a tool called the Teaching Goals Inventory (TGI), designed to help teachers clarify individual teaching goals (Cross and Fideler, 1988). Our next step is to design assessment measures keyed to those goals to help classroom teachers determine how close they are coming to accomplishing them.

2 The second gap I would like to identify is that between teaching and testing. Although there is clear evidence that students learn what they think they will be tested on, and almost everyone admits that tests are excellent motivators for learning, tests are rarely used to teach. They are most frequently used at the end of teaching to evaluate learning. The zipper that will narrow the gap between teaching and testing is a device that will teach *and* test at the same time.

In *Classroom Assessment Techniques: A Handbook for Faculty* that Tom Angelo and I have prepared, virtually every assessment measure is also a teaching tool (Cross and Angelo, 1988). If you want to teach critical thinking, for example, we suggest that you devise an exercise that requires students to practice critical thinking and simultaneously demonstrate their progress in achieving that complex skill. In this model, the teaching method itself provides the assessment. It is unlikely, for example, that critical thinking will be the result of a good lecture by the teacher, followed by a test on critical thinking. It is more likely that requiring students to practice critical thinking in a learning exercise will simultaneously teach the skill and reveal progress in learning it.

Alverno College has invented a workable zipper that effectively closes the gap between teaching and assessment. But even without the long-term investment and campus-wide involvement of an Alverno, there is much that can be done by teachers in their individual classrooms to close the gap between teaching and testing.

3 A third gap exists between the process of teaching and the content of the subject matter. Most critics today believe that elementary and secondary teachers give too much attention to process and not enough to content; thus the recommendations of the Holmes Group and Carnegie forum that teacher training needs to give more attention to teachers' knowledge of subject-matter content.

In higher education, it is just

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the opposite. Few people criticize college professors for not knowing their subject matter, but many think they don't know much about teaching it to others.

Research on teaching convinces many of us that content and process need to be joined in both research and practice. Research on teaching will be more productive if it recognizes that methods effective in teaching physics may not work in history. Modern research suggests that a major task of the teacher is to bridge the gap between what the learner already knows and what he or she needs to know (Ausubel, 1968; McKeachie, et.al., 1987). Teachers knowledgeable about the structure and special issues of their subject matter are currently underused in research on teaching: physics teachers have a lot to say about the most effective way to teach students the difference between density and weight, for example. Lee Shulman (1987) makes the additional point that college teachers of subject matter are teacher-educators, whether they know it or not. As they go about the business of teaching undergraduates, they serve as models for future teachers who will eventually show a tendency to teach as they were taught.

We believe that discipline-oriented specialists in physics, sociology, literature, or whatever, are in the best position to add to both research knowledge and practical knowledge about the processes of teaching. For too long we have encouraged education researchers to study process, and classroom teachers to study content. We believe that the zipper that can narrow the gap between process and content is classroom research, done by people who know the structures of subject matter and the difficulties of teaching it to others.

Unless teachers can make connections between their teaching and what students already know, learning is not likely to follow.

4 The fourth gap is that between curriculum and instruction. This is a gap prominent in the debates of the 1980's: Bloom, Hirsch, and others argue that the curricula we offer are inadequate. Their opponents argue that what we offer is OK; the problem is that students are not *learning* it—or that it is not taught effectively.

An analogy can be drawn between teaching and learning and buying and selling (though I don't wish to carry the analogy so far as to imply the "retailing" of learning as a product). We in education, through example and effort, are in the business of promoting learning as a *process*. But consider the analogy: we would not claim that something had been sold unless something had been bought. Similarly, we cannot claim that something has been taught unless something has been learned.

The bottom line in education, as in business, is not what we offer, but what students take away with them. We could lay out a beautiful program of studies with well-organized, knowledgeable lessons—all to no avail if students don't learn from it. The reverse is also true: we could have wonderful teachers struggling with a trivial, trendy curriculum, and students could learn it, but it wouldn't be worth their investment.

Throughout history, we in higher education love to address matters of curriculum reform; every 30 years, almost on schedule, we take up issues of General Education and the Core Curriculum. In contrast, we never really address issues in the quality of *instruction*, partly because it is an individual responsibility and partly because we value academic freedom and are reluctant to enter one another's classrooms. Classroom research makes it possible for classroom teachers themselves to assess the quality of learning in their own classrooms. More powerfully yet, classroom research can become a collaborative effort, within and across departments, to determine whether aggregated teaching goals add up to a curriculum and how much of that curriculum students are buying.

5 The fifth gap I'd like to eliminate is that between assessment and the improvement of learning. Today's most vigorous response to the current wave of criticism is assessment. Almost everyone, it seems, has concluded that we don't really know what students are learning in college and that we had better be about the business of finding out—both to improve what needs improving and to convince whoever needs convincing.

Ironically, perhaps, we seem to know more about how students change through incidental exposure to the college environment than we do about change from what we deliberately try to teach in the classroom. There is plentiful research on overall changes in values, attitudes, developmental stages, and the like coincident with the college experience (see, for example, Astin, 1977; Bowen, 1977; Chickering, 1969; Perry, 1970, and others); there is also information available on changes in standardized test scores as a result of education, usually in state- or nation-wide aggregations. But what happens to students in individual classrooms? This is less studied and less well-known, even by the teachers.

The rhetoric of assessment addresses the types of cognitive learning that are presumably the outcomes of classroom learning; in reality, the movement has a far stronger emphasis on the *collection* of data than on the eventual *use* of it to improve practice. How are we going to use the data collected in statewide and institu-

tional assessments to improve learning?

The stock answer of the assessment movement is, "through feedback." Providing administrators and teachers with the results of the assessment will presumably lead to improvement.

I'm not so sure. In the first place, present mechanisms for feedback fail to deliver concrete, usable information to individual faculty members, the people who ultimately control what is learned and how well. Secondly, even in the best of delivery systems, aggregating the test performance of thousands of students across hundreds of courses will not convince individual faculty members that they are accountable for the learning that takes place—or fails to take place—in their own classrooms.

Classroom research brings assessment into the classroom and joins assessment to the improvement of learning. It enables teachers to collect information relevant to their subject matter and their students and to *use* that information to improve the effectiveness of their teaching.

Few people criticize professors for not knowing their subject matter, but many think they don't know how to teach it to others.

6 The sixth gap has been complained about for years: the gap between educational research and practice. Why, ask the researchers, don't teachers use what we go to great pains to discover? Why, ask the practitioners, don't researchers investigate real problems and make the results useful to us?

The envied solution to this gap is the agriculture extension agent model, a middle-man who takes the results of university research to farmers in their fields. Although a great deal of money and effort has gone into educational R & D, we've never come close to matching the success of agriculture in demonstrating the usefulness of research and delivering it to practitioners.

Perhaps it is time to explore the possibility that the middle-man who interprets research to the practitioner is not necessary in education. Practitioners—in this case college professors—ought to be quite capable of doing their own research on the most effective ways to teach their disciplines to others.

Another approach to narrowing the gap between research and practice is to put a lot more effort into the dissemination of useful research findings. But this approach, even in times of great affluence, has some special problems when the intended audience (college professors) is well-educated, highly intelligent, and generally self-confident about their knowledge.

In the heyday of agriculture extension agents, it was assumed that the literate and knowledgeable were taking the message to poorly educated farmers who, even if they were at first skeptical of the practicality of advice from researchers, were willing to experiment. If the experiment worked, the credibility of the messenger was enhanced by the reward of improvements that were immediately visible and valuable to the farmer.

The situation is rather different with education: professors of education taking the message to professors in the disciplines are often rejected on the grounds that the less knowledgeable are trying to educate the more knowledgeable. Credibility to college teachers is a matter of knowledge of subject matter, and advising on teaching methods without knowledge of subject matter is suspect. (When the ag-extension agent gave advice on growing beans, he presumably knew his beans.)

For some of these same reasons, teachers in the disciplines rarely read any of the journals in education. Despite a great deal of good research on every conceivable question related to student evaluation of teaching, for example, few faculty outside of education have any knowledge of these findings, or even know where to locate them when they are appointed to a task force on the evaluation of teaching.

After considerable puzzlement and frustration over the difficulties of educating college professors about their common profession of teaching, I have reached the conclusion that teachers in the disciplines will have to get involved in doing their own research on teaching to make it both credible and useful. Classroom research is thus not only a promising route to advancing knowledge, but to disseminating and using it as well.

7 The seventh gap in higher education is the growing tension between research and teaching. Some maintain that this is a false dichotomy—that there is no gap between research and teaching, that teaching and research are inevitable partners in the work of college teachers (see, for example, the March 1988 issue of the *AAHE Bulletin*). Many college professors hold tenaciously to the conviction that research enhances teaching, despite little research support from those who have tried—so far in vain—to establish significant correlations between research productivity and teaching effectiveness (Linsky and Straus, 1975; Centra, 1983). Admittedly, there are problems in defining both "research productivity" and "teaching effectiveness," making research demonstrating a relationship extremely difficult. The everyday observations of most of us, however, would tend to support the lack of demonstrable relationships. There are outstanding researchers who are also outstand-

ing teachers, their teaching clearly enriched by their quests for knowledge. There are also outstanding researchers who are so wrapped up in their research that they have little time for students and are impatient with stumbling minds trying to grasp the basics of the subject. There are also outstanding teachers, so engrossed in the process of teaching that they have little time or energy left over for research. And, sad to say, there are ineffective teachers who are also non-productive researchers.

Most educators know, too, that good teachers must be active learners themselves and model for students an active mind at work on significant intellectual tasks. Teaching, however, properly understood, is just as intellectually demanding as research. Rather than urging dedicated teachers to engage themselves in advanced disciplinary research, we might better encourage them to join teaching and research in the classroom, with their students as participants, through research on teaching and learning.

Research on metacognition is showing that one of the characteristics that distinguishes good learners from poor is that good learners monitor their own learning processes. They are aware of themselves as learners. What better way to help students understand themselves as learners than to conduct research on teaching and learning in the classroom?

Good teachers must be active learners and model for students an active mind at work on significant intellectual tasks.

Such research is just as legitimate, and intellectually demanding, as research in the disciplines. For many teachers, and in the majority of institutions, it is also more feasible and productive.

8 The eighth and final gap lies in the growing discrepancy between intrinsic and extrinsic rewards. Most college teachers claim that they are more interested in teaching than in research (Carnegie, 1985), and that they teach primarily for intrinsic satisfactions (McKeachie, et. al., 1986). However, in the light of the recent "surge" toward rewards for research, (Schuster and Bowen, 1985), some teachers feel forced to give up the intrinsic satisfactions of teaching for the external rewards of research. Poor morale is the result when this gap between intrinsic and extrinsic rewards becomes excessive.

There are several ways to narrow this gap. The most commonly discussed method is to provide more external reward for teaching—to raise salaries, give teaching more weight in promotion and tenure decisions, provide recognition for outstanding teaching through teaching chairs and "best teacher" awards, and so on. But a parallel approach would be to increase the visibility and mobility of top teachers, making the rewards for teaching performance more comparable to those for research in these respects. Nothing would do quite so much to enhance the standing of teaching as for important colleges to launch nationwide talent searches and *raid* other campuses for their best teachers. Outstanding teachers are just as easy to identify as outstanding researchers; when outstanding teaching leads visibly to mobility, the status of teaching will be more greatly secured.

Classroom research, to close the circle on this argument, can serve to narrow the gap between intrinsic and extrinsic rewards for teaching by giving visibility, which leads to mobility, to those who show talent for teaching.

These, then, are eight gaps that surely need attention in higher education. Classroom research will not close them all; but involving college teachers directly in the assessment of student learning in their classrooms is one zipper that seems worth trying. □

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